



Tick-borne Infections: Lyme Disease and Anaplasmosis in Vermont and New Hampshire

Prevalence

As many as **1 in 8 dogs in Vermont** and **1 in 9 dogs in New Hampshire** are testing positive in 2018 for exposure to the spirochete *Borrelia Burgdorferi*, which causes **Lyme disease**. *Anaplasma phagocytophilum*, a rickettsial infection which can cause the disease **Anaplasmosis**, has a prevalence of **1 in 12 in Vermont and 1 in 9 in New Hampshire**; this can be an independent infection or can be a co-infection along with Lyme. New England has among the highest prevalence of exposure and clinical disease in the United States for both of these infections, and this has been climbing in the past several years. Not only are dogs being exposed, but so are their human counterparts. While transmission is via the tick vector only and *not* from dog to human, their exposure is a reflection of ours, as they live in and visit the same places we do.

You can see United States prevalence maps below, and click on individual states for more detail, courtesy of the Companion Animal Parasite Council (CAPC):

[Lyme Disease Prevalence map](#)

[Anaplasmosis Prevalence map](#)

Clinical Disease

Lyme Disease

Exposure to the Lyme spirochete *B. burgdorferi* should generate antibodies and a positive test result in the veterinary hospital, but this does not mean the patient is or will *ever* necessarily become ill with Lyme disease in the future. When it does, however, signs can be dramatic and include fever, lethargy, swollen and painful joints, enlarged lymph nodes, and a lack of appetite. If disease is present but undetected for longer periods of time, one is more likely to note a shifting limb lameness (limping) and may find more chronic changes in the joints. It can also infect the kidneys, and cause affected dogs to develop a grave condition called Lyme Nephritis, which is evident in signs referable to acute kidney injury (e.g., increased drinking and urinations, weight loss, and decreased appetite amongst others). At this time, only dogs have been documented to manifest clinical Lyme disease.

Anaplasmosis

This disease, like Lyme, can be clinically silent or may have a clinical presentation that includes decreased appetite, gastrointestinal upset (especially diarrhea), lethargy, weight loss, lymph node enlargement, and fever. The more concerning and different clinical sign from Lyme is the development of spontaneous bruising due to platelets being affected and a subsequent decreased ability for blood to clot. If severe enough, spontaneous nose bleeding can also occur.

Concerning Ticks and Vectors

Ixodes scapularis and *Ixodes pacificus* ticks (common name black legged or deer ticks), are the most common transmitters of Lyme disease and additional infections, such as Powassan virus in humans. A detailed description of the life cycle and photographs are available here: [CDC Lyme Disease Transmission](#)



Rhipicephalus sanguineus, or the brown dog tick, and *Dermacentor variabilis*, also known as the American dog tick, and *Amblyomma americanum* (the Lone Star tick) are also important transmitters of Anaplasma, Ehrlichia, and Rocky Mountain Spotted Fever, amongst a growing list of devastating tick-borne infections. More information and photographs of these ticks can be found here:

[Brown Dog Tick](#)

[American Dog Tick](#)

[Lone Star Tick](#)

Treatment

Treating a patient with a positive test result and correlating clinical signs is always recommended. For Lyme disease, four weeks of the antibiotic doxycycline at 5-10 mg/kg twice a day is standard. There are alternative antibiotic choices if doxycycline is not possible due to contraindications, intolerance, or if it is unavailable. Exceptional cases that are chronic or recurrent may require additional weeks or months of treatment on a case-by-case basis. Typically, when treating an acute (recent) infection, the response is rapid and thankfully, dramatic. Within two or three doses, patients feel much better and sustain improvement. The treatment for Anaplasma requires the same dose of antibiotic, but typically 21 days of treatment will suffice. Occasionally, cases require additional supportive care to address pain, excessive bleeding, dehydration, and other concerning signs of disease. Finally, calcium-containing foods may inhibit the absorption of doxycycline, so while it is good to give with food, it best to avoid dairy to ensure the medication is effective.

There is ongoing controversy about whether patients who are positive on in-house testing for Lyme and/or Anaplasma *without* any referable clinical signs should be treated. The arguments for not treating asymptomatic pets include the cost of antibiotics, the impact on the gastrointestinal microflora, and the inconvenience of treating for three to four weeks consecutively. There is no guarantee that treating will preempt clinical signs in the future. On the other side, arguments for treating are that signs can be subtle and missed in the acute phase, for example a day or two of low-grade fever in which a dog does not eat very well, or diarrhea that is not observed in the yard because the dog eliminates without direct supervision. These patients might eventually present with chronic disease, which is then treatable, but less reversible and may yield some chronic pain, especially in the case of arthritis. It is also possible that a co-infection not tested for may be effectively treated with antibiotic therapy. Less is known in animals than humans about

how these diseases affect the heart and nervous system, but these organ systems have been affected in experimental studies. Lyme nephritis, once found, is generally not reversible.

If your dog should test positive for one of these tick-borne infections in the absence of clinical signs, it is ideal to pursue more diagnostic testing to support or refute the need for treatment. These tests would include a complete blood count to assess platelets (often low with Anaplasma) and affected white blood cell lines, as well as a blood chemistry to assess for evidence of infection via globulins and total protein, and a urine analysis to assess for protein loss, which is especially prevalent with Lyme nephritis. With Lyme disease, there is also a quantitative titer called a Lyme quantitative C6, which helps to quantify the strength of the antibody response, not just a positive or negative result, and will allow one to follow the response to antibiotic treatment over the next three to six months. The only negative in pursuing additional diagnostics is the added cost, which can be cumulatively more than just the cost of antibiotic therapy alone.

Another scenario can also be of concern: when a dog is showing many of the hallmark clinical signs of tick-borne disease, but the standard antibody testing in-clinic is negative. In this case, we can run special DNA PCR tests at an outside lab to detect infection prior to the development of antibodies. We can start antibiotics therapy while the test is pending, and if there is no improvement within 72 hours of treatment, we will revisit other causes for these symptoms.

Prevention

The single most effective way to prevent Lyme and Anaplasma is the prevention of tick exposure and attachment. There is a vaccination (for dogs only) to prevent Lyme disease, which is 90% or more protective if given prior to exposure. There is currently no vaccination to prevent Anaplasmosis (clinical infection with Anaplasma) or many of the additional emerging tick-borne disease.

Treatment to prevent tick attachment is recommended year-round in endemic areas, especially New England states, as ticks are increasingly resistant to extreme weather changes. Even beneath a crust of snow, ticks can survive and climb up a blade of grass or the base of a tree to infect a passing host in winter.

Thankfully, there are currently many prescription oral (treat form) products that are efficacious and that are not rinsed away if your dog is bathed often or goes swimming. These can last from 4-12 weeks, depending on the product. They are also excellent at preventing fleas and other external parasites such as mange mites. A non-topical product is also a nice way to avoid worry about chemical ingestion in pets who groom one another, or toddlers who hug and kiss and their companions. There are no topical chemical compounds to ingest.

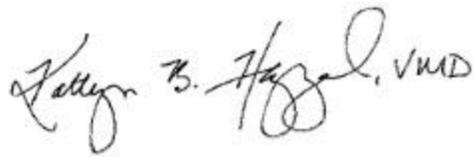


There are several topical prescription medications that work well, too. There are collars that provide 3-9 months of protection, depending on the brand, and there are also topical medications, most of which are applied monthly.

Finally, there are as-needed more natural products that can be used every time you go outdoors, comprised of essential oils that may deter external parasites, including ticks. These do not have clinical trials to support their efficacy, however.

Even dogs who do not venture beyond their own yard can be at risk, as ticks can lurk in shrubs and grasses, so we generally recommend prevention for all dogs who go outdoors.

Please do not hesitate to ask us for specific product recommendations.



Katy Hazzard, VMD



References:

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